

Amendments to the Claims:

Please amend claims 1-2, 5-6, 9, 23-24, 27-28, 32 and 33 as indicated below. Note that all claims are listed with appropriate status comments as required.

1. (Currently Amended)

A process for decomposing waste plastic comprising the steps of:

- a. supplying waste plastic;
- b. mixing said waste plastic with a diluent to create a solution;
- c. controlling ~~the~~ a relative free radical content of said solution;
- d. heating said solution to a reactant temperature to substantially depolymerize the waste plastic;
- e. maintaining control of said relative free radical content of said solution during said depolymerization process; and
- e f. collecting the by products of said depolymerization process.

01 2. (Currently Amended)

A process for the recycling of waste plastic comprising:

- a. mixing said waste plastic with oil to form a mixture;
- b. heating said mixture in the presence of about 0.5% to 10% wt of a free radical initiator to between about 325 and 375°C for a period less ~~then~~ than about one hour; and
- c. recovering hydrocarbon distillate as an overhead product and condensing and storing said distillate.

3. (Original)

A process for decomposing waste plastic as described in claim 1 wherein said step of heating said solution to a reactant temperature to substantially depolymerize the waste plastic comprises the step of heating to less than about 400°C.

4. (Original)

A process for decomposing waste plastic as described in claim 1 wherein said step of heating said solution to a reactant temperature to substantially depolymerize the waste plastic comprises the step of heating to about 375°C.

5. (Currently Amended)

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A process for decomposing waste plastic as described in claim 1, wherein said step of controlling a relative free radical content of said solution ~~controlling the content of said solution~~ comprises the step of adding a third substance to said process respective of said waste plastic and said oil.

6. (Currently Amended)

A process for decomposing waste plastic as described in claim 1 wherein said step of controlling a relative free radical content of said solution ~~controlling the content of said solution~~ comprises the step of controlling free radical precursor of said solution.

7. (Previously Amended)

A process for decomposing waste plastic as described in claim 6 wherein said step of controlling free radical precursor of said solution comprises the step of adding a waste plastic material to said process.

8. (Previously Amended)

A process for decomposing waste plastic as described in claim 6 wherein said step of controlling free radical precursor of said solution comprises the step of adding a substance chosen from a group consisting of polyvinyl chloride and polyurethane.

9. (Currently Amended)

A process for decomposing waste plastic as described in claim 1 wherein said step of controlling a relative free radical content of said solution ~~controlling the content of said solution~~ comprises the step of sensing the relative amount of free radicals likely to be present in said solution after it is heated.

10. (Previously Amended)

A process for decomposing waste plastic as described in claim 9 wherein said step of sensing the relative amount of free radicals likely to be present in said solution after it is heated comprises the step of ascertaining the reactant temperature of said solution.

11. (Original)

A process for decomposing waste plastic as described in claim 1 and further comprising the step of recycling a portion of said diluent.

12. (Original)

A process for decomposing waste plastic as described in claim 1 and further comprising the step of recycling from 0 to 95% of said diluent.

13. (Original)

A process for decomposing waste plastic as described in claim 11 wherein said step of recycling a proportion of said diluent comprises the step of recycling from 70% to 90% of said diluent.

14. (Original)

A process for decomposing waste plastic as described in claim 1 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with an oil.

15. (Original)

A process for decomposing waste plastic as described in claim 1 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with a heavy oil.

16. (Original)

A process for decomposing waste plastic as described in claim 1 wherein said step of mixing said waste plastic with a diluent to create a solution comprises the step of mixing said waste plastic with a low value oil.

17-22. (Cancelled)

23. (Currently Amended)

A process for decomposing waste plastic as described in claim 1, wherein said step of controlling a relative free radical content of said solution ~~controlling the content of said solution~~ comprises controlling the free radical content of said solution.

24. (Currently Amended)

A process for decomposing waste plastic as described in claim 1, wherein said step of controlling a relative free radical content of said solution ~~controlling the free radical content~~ comprises controlling the free radical content to substantially depolymerize said waste plastic.

25. (Previously Added)

A process for the recycling of waste plastic as described in claim 2, wherein said waste plastic comprises comminuted waste plastic selected from the group consisting of: polyethylene, polypropylene, polystyrene, nylon-66, polyurethane, polyethylene terephthalate, polyvinyl chloride resin, and combinations thereof.

26. (Previously Added)

A process for the recycling of waste plastic as described in claims 25, wherein said oil comprises oil selected from the group consisting of: waste motor oil, FCC slurry oil, vacuum distillation tower bottoms, fluidized catalytic cracker slurry oil, heavy heating oil, bunker oil, and combinations thereof.

27. (Currently Amended)

A process for the recycling of waste plastic as described in claim 1 wherein said solution ~~the free radical initiator~~ comprises a separate catalyst precursor ~~added to said waste plastic and/or said oil.~~

28. (Currently Amended)

A process for the recycling of waste plastic as described in claim 1 wherein said waste plastic includes polyvinyl chloride and no separate free radical catalyst precursor is added to said solution ~~employed.~~

29. (Previously Added)

A process for the recycling of waste plastic as described in claim 26 wherein said waste plastic dissolves in said oil.

30. (Previously Added)

A process for the recycling of waste plastic as described in claim 26 wherein the distillate comprises a distillate selected from the group consisting of toluene, styrene, and combinations thereof.

31. (Previously Added)

A process for the recycling of waste plastic as described in claim 26 wherein additional free radical initiator is introduced in response to a decrease in distillate yield or increase in temperature.

32. (Currently Amended)

A process for the recycling of waste plastic as described in claim 26 wherein said overhead further comprises non-condensable gas and ~~normally-solid-speciality~~ a specialty substances that has commercial potential when purified and that is in a solid state under normal environmental conditions.

33. (Currently Amended)

A process for the recycling of waste plastic as described in claims 29, 30, 31, or 32 ~~29-32~~, wherein oil containing dissolved waste plastic is recycled to a reactor.